

may extend it self more then as high again, nay, perhaps indefinitely, or beyond the Moon; for the Elaters and Expansions being in reciprocal proportions, since we cannot yet find the *plus ultra*, beyond which the Air will not expand it self, we cannot determine the height of the Air: for since, as we have shewn, the proportion will be alway as the pressure sustain'd by any part is to 35. so 1000. to the expansion of that part; the multiplication or product therefore of the pressure, and expansion, that is, of the two extream proportionals, being alwayes equal to the product of the means, or 35000. it follows, since that Rectangle or Product may be made up of the multiplication of infinite diversities of numbers, that the height of the Air is also indefinite; for since (as far as I have yet been able to try) the Air seems capable of an indefinite Expansion, the pressure may be decreased in *infinitum*, and consequently its expansion upwards indefinite also.

There being therefore such a difference of density, and no Experiment yet known to prove a *saltus*, or skipping from one degree of rarity to another much differing from it, that is, that an upper part of the Air should so much differ from that immediately *subjacent* to it, as to make a distinct superficies, such as we observe between the Air and Water, &c. But it being more likely, that there is a continual increase of rarity in the parts of the Air, the further they are removed from the surface of the Earth: It will hence necessarily follow, that (as in the Experiment of the salt and fresh Water) the ray of Light passing obliquely through the Air also, which is of very different density, will be continually, and infinitely inflected, or bended, from a streight, or direct motion.

This granted, the reason of all the above recited *Phænomena*, concerning the appearance of the Celestial Bodies, will very easily be deduced. As,

First, The redness of the Sun, Moon, and Stars, will be found to be caused by the inflection of the rays within the *Atmosphere*. That it is not really in or near the luminous bodies, will, I suppose, be very easily granted, seeing that this redness is observable in several places differing in Longitude, to be at the same time different, the setting and rising Sun of all parts being for the most part red,

And secondly, That it is not meerly the colour of the Air interpos'd, will, I suppose, without much more difficulty be yielded, seeing that we may observe a very great *interstitium* of Air betwixt the Object and the Eye, makes it appear of a dead blew, far enough differing from a red, or yellow.

But thirdly, That it proceeds from the refraction, or inflection, of the rays by the *Atmosphere*, this following Experiment will, I suppose, sufficiently manifest.

Take a spherical CrySTALLINE Viol, such as is describ'd in the fifth Figure A B C D, and, having fill'd it with pure clear Water, expose it to the Sun beams; then taking a piece of very fine *Venice Paper*, apply it against that side of the Globe that is opposite to the Sun, as against the

side B C, and you shall perceive a bright red Ring to appear, caus'd by the refraction of the Rays, A A A A, which is made by the Globe; in which Experiment, if the Glas and Water be very cleer, so that there be no Sands nor bubbles in the Glas, nor dirt in the Water, you shall not perceive any appearance of any other colour. To apply which Experiment, we may imagine the *Atmosphere* to be a great transparent Globe, which being of a substance more dense then the other, or (which comes to the same) that has its parts more dense towards the middle, the Sun beams that are tangents, or next within the tangents of this Globe, will be refracted or inflected from their direct passage towards the center of the Globe, whence, according to the laws of refractions made in a triangular *Prism*, and the generation of colour set down in the description of Muscovi-glas, there must necessarily appear a red colour in the *transitus* or passage of those tangent Rays. To make this more plain, we will suppose (in the sixth Figure) A B C D, to represent the Globe of the *Atmosphere*, E F G H to represent the opacous Globe of the Earth, lying in the midst of it, neer to which, the parts of the Air sustaining a very great pressure, are thereby very much condens'd, from whence those Rays that are by inflection made tangents to the Globe of the Earth, and those without them, that pass through the more condens'd part of the *Atmosphere*, as suppose between A and E, are by reason of the inequality of the *medium*, inflected towards the center, whereby there must necessarily be generated a red colour, as is more plainly shewn in the former cited place; hence whatsoever opacous bodies (as vapours, or the like) shall chance to be elevated into those parts, will reflect a red towards the eye; and therefore those evenings and mornings appear reddest, that have the most store of vapours and halitious substances exhaled to a convenient distance from the Earth; for thereby the inflection is made the greater, and thereby the colour also the more intense; and several of those exhalations being opacous, reflect several of those Rays, which, through an *Homogeneous* transparent *medium* would pass unseen; and therefore we see, that when there chances to be any clouds situated in those Regions they reflect a strong and vivid red. Now, though one great cause of the redness may be this inflection, yet I cannot wholly exclude the colour of the vapours themselves, which may have something of redness in them, they being partly nitrous, and partly fuliginous; both which steams tinge the Rays that pass through them, as is made evident by looking at bodies through the fumes of *Aqua fortis*, or spirit of *Nitre* [as the newly mentioned Illustrious Person has demonstrated] and also through the smoak of a Fire or Chimney.

Having therefore made it probable at least, that the morning and evening redness may partly proceed from this inflection or refraction of the Rays, we shall next shew, how the Oval Figure will be likewise easily deduced.

Suppose we therefore, E F G H in the sixth Figure of the 37. Scheme, to represent the Earth; A B C D, the *Atmosphere*; E I, and E L, two Rays coming from the Sun, the one from the upper, the other from the neather Limb,